UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/586,050	06/02/2000	Todd O. Bolken	MICS:0038	5710

7590 04/14/2003

Michael G Fletcher
Fletcher Yoder & Van Someren
P O Box 692289
Houston, TX 77269-2289

EXAMINER	
TRAN, THANH Y	

ART UNIT	PAPER NUMBER
2841	

DATE MAILED: 04/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/586,050	BOLKEN ET AL.	
	Examiner	Art Unit	
	Thanh Y. Tran	2841	

-- The MAILING DATE of this communication app ars on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-17,19-33 and 35-63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-17,19-33 and 35-63* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Applicant's arguments with respect to claims 1, 3-17, 19-33 and 35-63 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 13-17, 29-33, 45-47, and 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al. (U.S. 5,988,511) in view of Bellaar (U.S. 5,861,666).

With respect to claims 1, 13-14 and 31-32, Schmidt et al. discloses a system (see Fig. 4-5) comprising a memory device (comprising elements 3 & 25, Fig. 3) the memory device (3, 25) comprising a plurality of vertically stacked carriers (3, Figs. 3-6), each carrier having a memory chip (25), and wherein the vertically stacked carriers comprise: a plurality of packages (1), each of the plurality of packages (1) comprising a plurality of mateable alignment features (7, Figs. 2 & 4), and wherein each of the plurality of packages (1) is physically coupled to another of the plurality of packages (1); and a plurality of memory chips (25), each of the plurality of memory chips (25) physically coupled to a respective one of the plurality of packages (1).

Schmidt et al. does not teach a system comprising a processor; and a memory device that comprises a plurality of vertically stacked ball grid arrays; each of the plurality of packages comprises vias extending therethrough to connect solder balls of adjacent packages serially. Bellaar teaches a system (Fig. 3) comprising a processor dice (170) and a memory device

(comprising elements 134, 137, 180, 122) comprising a plurality of vertically stacked ball grid arrays (184) (see Fig. 3, col. 7, lines 55-63); each of the plurality of packages comprises vias (182) extending therethrough to connect solder balls (184) of adjacent packages serially (see col. 7, lines 29-63). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the system of Schmidt et al. by including a processor and a plurality of vertically stacked ball grid arrays as taught by Bellaar for the purpose of electrical interconnecting each adjacent package.

With respect to claim 15, it recites limitations similar to claim 1. Therefore, it is rejected for the same reasons.

With respect to claim 16, Schmidt et al. discloses a memory board (Fig. 3) wherein the substrate (3) is a printed circuit board (comprising memory chip 25).

As to claim 17, Schmidt et al. discloses a memory board (Figs. 2-3) comprising a memory controller (25) operatively coupled to the memory device (3) and to the substrate (1).

Claims 29-30 recites limitations similar to claims 13-14. Therefore, they are rejected for the same reasons (as discussed above in claims 1 and 13-14).

Claim 33 recites limitations similar to claim 15. Therefore, it is rejected for the same reasons.

Claim 45 recites limitations similar to claim 13. Therefore, it is rejected for the same reasons.

Claim 46 recites limitations similar to claim 14. Therefore, it is rejected for the same reasons.

As to claims 47 and 54, Schmidt et al. discloses a device (Figs. 3-5) comprising a chip (25, Fig. 3); and a package (1) operatively coupled to the chip (25), the package (1) comprising: a first side; a second side; a plurality of first mateable alignment features (7, Figs. 2-4) on the first side of the package; and a plurality of second mateable alignment features on the second side of the package (7, Fig. 3).

As to claim 53, Schmidt et al. discloses a device (Figs. 3-5) wherein each of the plurality of memory chips (25) coupled to a package (1).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 3-12, 19-28, 35-44, 48-52 and 55-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt et al. (U.S. 5,988,511) in view of Mostafazadeh et al. (U.S. 5,783,870).

With respect to claim 3, Schmidt et al. does not disclose each package comprises a molded resin body having a die side and a wire side. Mostafazadeh et al. discloses a system (see Figs. 5, 6 and 7H) wherein each package comprises a molded resin body (see Fig. 7D, element 118) having a die side and a wire side (116) (see Fig. 7D, elements 110; 116 and 118). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the package of Schmidt et al, to include a molded resin body

having a die side and a wire side as taught by Mostafazadeh et al., in order to protect the electronic component of the package from being damaged caused by the effect of environment.

With respect to claim 4, Schmidt et al. discloses a system (Figs. 4-5) wherein each package comprises a plurality of first mateable alignment features (7, Figs. 2-4) on the die side of the package (1); and a plurality of second mateble alignment features (7, Fig. 2) on the wire side of the package (1).

With respect to claims 5-8, Schmidt et al discloses a system (Figs. 4-5) wherein the plurality of first mateable alignment features (7, Figs. 2-5) are male and the plurality of second mateable alignment features are female; the plurality of first mateable alignment features are male and the plurality of second mateable alignment features are male; the plurality of first mateable alignment features are female and the plurality of second mateable alignment features are male; and wherein the plurality of first mateable alignment features are female and the plurality of second mateable alignment features are female (as shown in figure 4).

With respect to claim 9, figures 4 and 5 of Schmidt et al show the plurality of first mateable alignment features (7) and the plurality of second mateable alignment features (7) orient adjacent packages in a unique location.

With respect to claim 10, figure 5 of Schmidt et al shows the plurality of first mateable alignment features and the plurality of second mateable alignment features are arranged asymmetrically (see labeled features in figure 5).

With respect to claim 11, figures 4 and 5 of Schmidt et al show the plurality of first mateable alignment features and the plurality of second mateable alignment features comprising of at least one unique alignment feature.

With respect to claim 12, figures 4 and 5 of Schmidt et al show the plurality of first mateable alignment features and the plurality of second mateable alignment features support adjacent packages (1).

Claim 19 recites limitations similar to claim 3. Therefore, it is rejected for the same reasons.

Claim 20 recites limitations similar to claim 4. Therefore, it is rejected for the same reasons.

Claims 21-22 recite limitations similar to claims 5-6. Therefore, they are rejected for the same reasons.

Claim 23 recites limitations similar to claim 7. Therefore, it is rejected for the same reasons.

Claim 24 recites limitations similar to claim 8. Therefore, it is rejected for the same reasons.

Claims 25-28 recite limitations similar to claims 9-12. Therefore, they are rejected for the same reasons.

Claim 35 recites limitations similar to claim 3. Therefore, it is rejected for the same reasons.

Claim 36 recites limitations similar to claim 4. Therefore, it is rejected for the same reasons.

Claim 39 recites limitations similar to claim 7. Therefore, it is rejected for the same reasons.

Claims 37-38 and 40 recite limitations similar to claims 5-6 and 8. Therefore, they are rejected for the same reasons.

Claims 41-44 recite limitations similar to claims 9-12. Therefore, they are rejected for the same reasons.

Claim 48 recites limitations similar to claim 3. Therefore, it is rejected for the same reasons.

Claim 51 recites limitations similar to claim 7. Therefore, it is rejected for the same reasons.

Claims 49-50 and 52 recite limitations similar to claims 5-6 and 8. Therefore, they are rejected for the same reasons.

Claim 55 recites limitations similar to claim 3. Therefore, it is rejected for the same reasons.

Claim 58 recites limitations similar to claim 7. Therefore, it is rejected for the same reasons.

Claims 56-57 and 59 recite limitations similar to claims 5-6 and 8. Therefore, they are rejected for the same reasons.

Claims 60-63 recite limitations similar to claims 9-12. Therefore, they are rejected for the same reasons.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yanagida teaches relevant prior art to the invention.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Y. Tran whose telephone number is (703) 305-4757. The examiner can normally be reached on Monday through Thursday and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin, can be reached on (703) 308-3121. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3431.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TYT

DAVID MARTIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800